IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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First Named Inventor	: Joseph Wayne NORTON		
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Examiner	: Jeffery Swearingen		
Docket No.	: 101610.55984US		
Customer No.	: 23911		
Title	: Distributed, Fault-Tolerant Message Store		

APPEAL BRIEF

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

On October 8, 2008, Appellant appealed to the Board of Patent Appeals from the final rejection of claims 1-36. The following is Appellant's Appeal Brief submitted pursuant to 37 C.F.R. § 1.192.

I. REAL PARTY IN INTEREST

An assignment of the present application to Gemini Mobile Technologies, Inc. was recorded on March 25, 2004 at Reel/Frame 015136/0259.

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any appeals, interferences or other proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-36 remain pending, rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

Appellants have not submitted any amendments subsequent to the final Office Action mailed on June 12, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER[1]

Appellants disclose and claim techniques that provide improved scalability and fault-tolerance for storage and retrieval of messages destined for mobile devices.[2] Conventional message storage and retrieval techniques that rely upon a single server are unable to scale to increase capacity and performance requirements, and also require frequent backup operations to maintain data in the event of a server failure.[3] Conventional techniques that use multiple, distributed severs require human intervention to reconfigure the network in the event of a server failure, and accordingly are unable to reliably handle server failures.[4] Conventional techniques also encounter problems when moving mailboxes for load-balancing reasons. This typically requires copying the mailboxes to a new location and deleting the old mailboxes, and access to the mailboxes cannot be achieved until the move is complete.[5]

Exemplary embodiments of the present invention overcome the above-identified and other deficiencies of conventional techniques by using addressing functions, which correspond to a topology of the network, for storage and

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[1] Citations to the specification and drawings are merely for the purposes of complying with Appeal Brief rules, and do not represent every instance of support for the claim elements. Accordingly, these citations should not be interpreted as limiting the claim scope.
[2] Paragraph 0002.
[3] Paragraph 0004.
[4] *Id.*
[5] Paragraph 0026.

retrieval of information. Accordingly, as network nodes are added or removed, new addressing functions, corresponding to the updated network topology, can be employed. Specifically, the identification of the node for storage or retrieval of a message is determined using the addressing functions, which reflect the topology of the network. By reflecting the current topology of the network, the use of the addressing functions overcomes the above-identified deficiencies of conventional systems.

Turning now to the claims, claims 1 and 21 respectively recite a method of managing a network and a computer readable medium to store a set of instructions capable of being executed by a processor. The method and set of instructions involve calculating a plurality of destination nodes based on a subscriber identifier and a plurality of addressing functions, each addressing function corresponding to a topology of the network at a particular moment in time (step 14).[6] The method and set of instructions also involve querying the calculated plurality of destination nodes for a message (step 18).[7]

Claims 4, 15 and 24 recite that the originator of the message retrieval request is a wireless handset 44, the message being at least one of a short messaging service message and a mail digest.[8]

[6] Figure 2 and paragraph 0014.
[7] *Id.*
[8] Figures 3-5 and paragraph 0036.

Claims 5, 16 and 25 recite that the originator of the message retrieval request is a wireless handset, the message being a long messaging service message.[9]

Claims 7 and 27 respectively depend from claims 2 and 22, and further recite receiving the message at an initial storage node, the message including the subscriber identifier (step 62); calculating an actual destination node based on the subscriber identifier and a current addressing function corresponding to a current topology of the network (step 64); and sending the message to the actual destination node for storage, the calculated plurality of destination nodes including the actual destination node and the plurality of addressing functions including the current addressing function (step 66).[10]

Claims 8 and 29 respectively depend from claims 7 and 27, and further recite storing the message to an internal queue of the initial storage node; and removing the message from the internal queue if a confirmation of receipt is received from the actual destination node.[11]

Claims 10, 18 and 30 recite expiring one or more of the plurality of addressing functions based on a message validity period.[12]

[9] Figures 3-5 and paragraph 0038.
[10] Figure 1 and paragraph 0013.
[11] Paragraph 0013.
[12] Paragraph 0019.

Claims 11, 19 and 31 recite expiring one or more of the plurality of addressing functions for an expired destination node based on a local expiration signal from the expired destination node.[13]

Claims 12, 20 and 32 recite applying a time stamp to each of the plurality of addressing functions; and delivering each of the plurality of addressing functions to the plurality of destination nodes before activation.[14]

Claims 13 and 33 respectively depend from claims 1 and 14 and recite that the addressing functions are hash functions.[15]

Claim 14 recites a method of managing a network. The method involves receiving a message at an initial storage node, the message including a subscriber identifier (step 62); calculating an actual destination node based on the subscriber identifier and a first addressing function corresponding to a current topology of the network (step 64); sending the message to the actual destination node for storage (step 66); storing the message to an internal queue of the initial storage node; removing the message from the internal queue if a confirmation of receipt is received from the actual destination node; sending a message waiting indicator message toward a device associated with the subscriber identifier; receiving a message retrieval request at an initial retrieval node of the network, the message retrieval request including the subscriber identifier (step 12); calculating a plurality of destination nodes based on the

[13] Paragraph 0021.
[14] Paragraph 0022.
[15] Paragraph 0017.

subscriber identifier and a plurality of addressing functions, each addressing function corresponding to a topology of the network at a particular moment in time, the plurality of destination nodes including the actual destination node and the plurality of addressing functions including the first addressing function (step 14); querying the calculated plurality of destination nodes for the message; receiving the message from the actual destination node (step 18); and forwarding the message toward an originator of the message retrieval request, wherein the addressing functions are hash functions.[16]

Claim 34 recites a method of managing a network. The method involves receiving, by a first node that stores messages, a message retrieval request (step 12); calculating, by the first node using a subscriber identifier and a first addressing function, a second node that stores messages (step 14); calculating, by the first node using the subscriber identifier and a second addressing function, a third node that stores messages (step 14); and forwarding, by the first node, the message retrieval request to the second and third nodes.[17]

VI. GROUNDS OF REJECTION TO BE REVIEW ON APPEAL

Appellants request review of the rejection of claims 1-36 for anticipation by U.S. Patent No. 6,138,158 to Boyle et al. ("Boyle").

[16] Figures 1 and 2, and paragraphs 0013-0015, 0017 and 0034.
[17] Figure 2 and paragraphs 0014-0017.

VII. ARGUMENT

Boyles does not anticipate claims 1-36 because Boyle does not expressly or inherently disclose all of the elements of these claims. Additionally, with respect to certain dependent claims, the rejection is based upon an inconsistent interpretation of Boyle in which characteristics disclosed by Boyle as being associated with one message are interpreted as being associated with a different message, without any disclosure in Boyle supporting the position that these characteristics are associated with both messages.

A. Boyle Does Not Disclose All of the Elements of Claims 1 and 21

Appellants' claims 1 and 21 respectively recite a method and a computer readable medium to store a set of instructions capable of being executed by a processor that involve calculating a plurality of destination nodes based on:

1. a subscriber identifier; and
2. a plurality of addressing functions.

Each addressing function corresponds to a topology of the network at a particular moment in time. The calculated plurality of destination nodes is queried for a message.

As will be described in more detail below, the Office Action does not clearly identify which elements of Boyle correspond to the above-identified claim elements, and accordingly Appellants' discussion below is based upon assumptions as to different ways that Boyle could be interpreted. Nevertheless,

under any interpretation, Boyle does not expressly or inherently disclose all of the aforementioned claim elements.

Boyle discloses a system in which a narrowband channel is used to provide a client device with a notification of updates to information pages, and the client device requests and receives the updated pages over a wideband channel.[18] Specifically, referring now to Figure 2 of Boyle (reproduced below), when there is a change or update to information subscribed to by mobile device 106, web server 202 sends a notification to link server 114, which in turn sends the notification to mobile device 106.[19] The notification includes: (1) one or more URLs; (2) an action type; and (3) a subscriber ID.

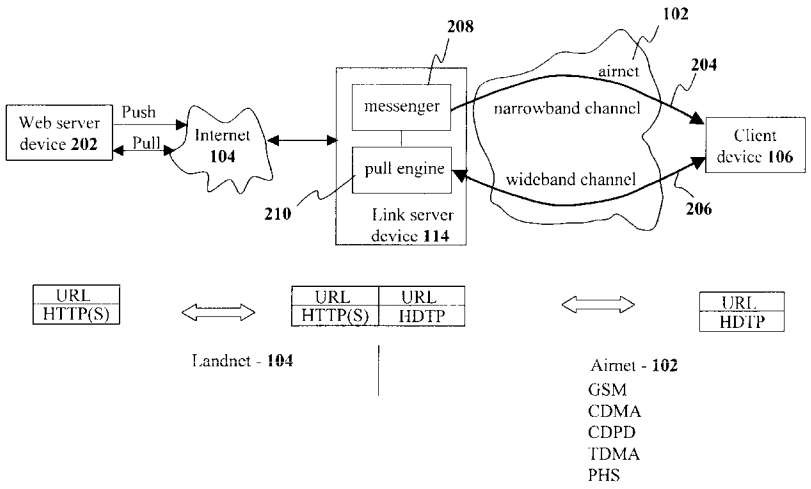

FIGURE 2 of Boyle

Mobile device 106 can then access the updated information "through a pull agent 210 via wideband channel 206 using the address embedded in the

[18] Abstract.
[19] Column 7, lines 12-27.

notification."[20] Thus, Boyle at most discloses that link server 114 identifies a *single* node, (i.e., client device 106) *based solely on a subscriber ID*. In contrast, the method of Appellants' claim 1 recites "calculating a *plurality* of destination nodes" based on a subscriber ID and "*a plurality of addressing functions*"[21]

The Office Action cites column 8, lines 1-13 of Boyle for the disclosure of the calculation recited in claims 1 and 21. This section of Boyle discloses that the cost of switched circuit connections is minimized by sending a notification to the user, and then allowing the user to decide "what and when to do with the update."[22] In other words, this section merely describes that a user is notified of updated content over narrowband channel 205 and can choose which content to download over wideband channel 206. There is no disclosure or suggestion in the cited section of Boyle of calculating *a plurality of nodes*, or performing such a calculation based on a subscriber ID *and a plurality of addressing functions*.

The Response to Arguments section of the final Office Action supports the rejection of the calculation of claims 1 and 21 by stating:

> A user subscribes to Boyle's service - *based on a subscriber identifier*. The physical connection is measured in terms of seconds - *each addressing function corresponding to a topology of the network at a particular moment of time*. Both narrowband and wideband channels are available - *a plurality of destination nodes based on a subscriber identifier and a plurality of addressing functions, each addressing function corresponding to a topology of the network at a particular moment in time*.[23]

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[20] Column 7, lines 48-51.
[21] Emphasis added.
[22] Column 8, lines 3-10.
[23] Page 2.

This statement does not make clear which elements of Boyle are being interpreted as the claimed "plurality of destination nodes" or the claimed "plurality of addressing functions". Instead, this statement appears to merely conclude that because narrowband and wideband channels are available, addressing functions are employed in Boyle. Notably, the Patent Office fails to provide a citation to Boyle to support this conclusion, likely because no such support can be found.

1. The Uniform Resource Locators (URLs) of Boyle are Not the Same as the Claimed "Addressing Functions"

Based on the Office Action's interpretation of Boyle to reject claim 34 (described in more detail below), it appears that the uniform resource locators (URLs) of Boyle are being interpreted as the claimed "addressing functions."[24] Boyle, however, does not expressly or inherently disclose that URLs are addressing *functions*, but instead merely refers to URLs as addresses. For example, Boyle discloses that

- "each of the HDML pages is identified by a *distinct address*, such as an universal resource locator (URL)"[25];
- "[t]he notification comprises: *an address*-one or more URLs identifying the updated pages"[26]; and
- "the notification comprises a subscriber ID and an *address including one or more URLs* indicating those pages whose contents have been updated."[27]

[24] Because the Office Action does not specifically identify the element of Boyle that corresponds to the claimed addressing functions, this is Appellants' best guess. If, however, the Office Action has a different interpretation, that interpretation should be set forth in a formal Patent Office communication.
[25] Column 7, lines 17-19. (Emphasis added).
[26] Column 7, lines 28-30. (Emphasis added).

Thus, interpreting a URL, which is merely disclosed as an address, as the claimed "addressing *function*" ignores the claim term "function", and instead only focuses on the term "addressing." Because the Office Action does not consider the term "function" in the rejection of claims 1 and 21, this rejection is improper.

Moreover, a URL does not correspond "to a topology of the network at a particular moment in time." In contrast, Appellants' claim 1 specifically recites that the claimed "addressing function" possesses this characteristic.

As discussed above, the Response to Arguments section of the final Office Action appears to interpret the narrowband and wideband channels of Boyle as corresponding to the claimed "topology of the network".[28] Boyle does not, however, disclose that the URL and the subscriber ID are used to select the narrowband or wideband channel. Instead, Boyle discloses that the narrowband channel is selected to deliver notifications to the mobile station, and the wideband channel is selected to retrieve the information identified in the notification.

Because Boyle does not disclose each and every element of Appellants' claims 1 and 21, and the Office Action's interpretation of Boyle does not result in the method or computer readable medium of claims 1 and 21, the rejection of this claim is improper and should be withdrawn. Independent claim 14 recites similar elements to those discussed above with regard to claims 1 and 21, and are patentably distinguishable over Boyle for similar reasons. Additionally,

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[27] Column 10, lines 40-42. (Emphasis added).
[28] Page 2 of the final Office Action.

claim 14 recites that the "addressing functions are hash functions", which as will be described in more detail below in connection with claims 13 and 33, is not disclosed by Boyle.

B. The Rejection is Based Upon an Improper Incorporation of Characteristics Associated with One Message as Being Associated with a Different Message to Reject Claims 4, 5, 8, 10-12, 15, 16, 18-20, 24, 25 and 29-32

It is well established that anticipation requires that "[t]he elements [*in the prior art*] must be arranged as required by the claim."[29] The rejections of claims 1, 14 and 21 rely upon the information obtained using a URL as disclosing the claimed "message" and the rejection of claim 2 relies upon the message requesting the information associated with a URL as disclosing the claimed "message retrieval request". As illustrated in Figure 4 of Boyle (reproduced below), the request for information associated with a URL and providing the requested information is performed via Interworking Function (IWF) 206.

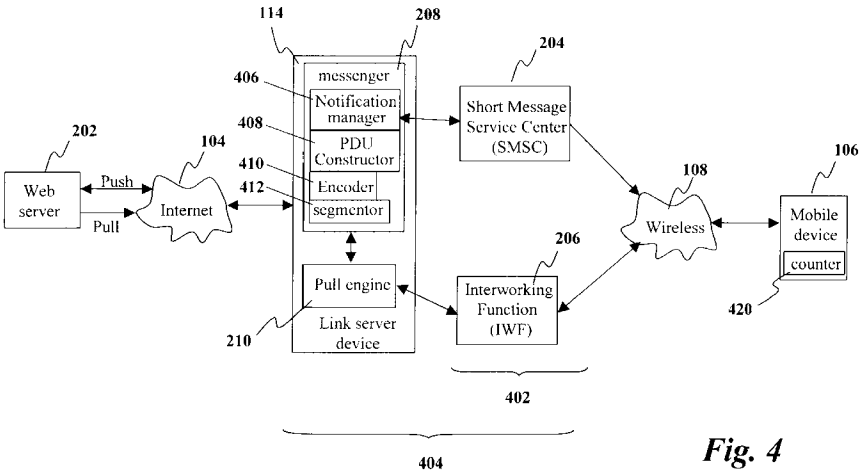


Fig. 4

FIGURE 4 of Boyle

[29] M.P.E.P. § 2131, citing *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990).

The rejection then relies upon aspects of the PUSH PDU message sent via short message service center (SMSC), which notifies client device 106 of the updated content, as disclosing aspects of the claimed "message". Because the rejection relies upon characteristics of the PUSH PDU message notifying client device 106 of updated content (which is transmitted via SMSC 204), and not aspects of the message containing the actual content that is sent in response to a request for the content (which is transmitted via IWF 206), this interpretation of Boyle does not satisfy the requirements that the prior art disclose the elements "arranged as required by the claim."[30] In other words, for the rejection to be a proper anticipation rejection Boyle must disclose that the characteristics of the PUSH PDU are also applicable to the messages used for requesting and providing the content via IWF 206, which Boyle does not.

For example, the rejection of the characteristics of the "message" of claims 4, 5, 15, 16, 24 and 25 cites column 12, lines 54-67 of Boyle, and the rejection of the use of the "message" of claims 8 and 29 cites column 12, lines 15-43.[31] This section of Boyle discuses the PUSH PDU, which is sent by notification manager 406 via SMSC 204 to notify mobile device 106 of updated content.[32] Because this section of Boyle discusses the PUSH PDU, which is disclosed as a distinctly different message from that relied upon to reject the "message" of claim 1 (i.e., the message transmitted via IWF 206), this disclosure of Boyle is irrelevant to aspects of the claimed "message." Furthermore, there is nothing in Boyle

[30] M.P.E.P. § 2131, citing *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990).
[31] The rejection of claims 8 and 29 only cites
[32] See, for example, column 12, lines 15-68.

supporting the interpretation that the aspects of the PUSH PDU can also apply to the messages transmitted via IWF 206.

Similarly, with regard to claims 10-12, 18-20 and 30-32, the rejection relies upon characteristics of the PUSH PDU message sent to notify client device 106 of new content to reject claim features related to the addressing functions.

For example, claims 10, 18 and 30 recite "expiring one or more of the *plurality of addressing functions* based on a message validity period"[33], and claims 11, 19 and 31 recite "expiring one or more of the *plurality of addressing functions* for an expired destination node based on a local expiration signal from the expired destination node."[34] As discussed above, it is not clear which element of Boyle is being asserted as disclosing the claimed addressing functions, but at best it appears that the rejection relies upon the URLs of Boyle. Instead of citing a portion of Boyle that discusses expiration of URLs, the rejection cites column 16, lines 11-13. This section of Boyle discusses a timeout value for sending the PUSH PDUs notifying client device 106 of new content, which is used "to prevent the message system from perpetually trying to send the message fragment."[35] There is no indication that this timeout value is used to expire the URL, as would be required to support an anticipation rejection using the reasoning provided in the rejection.

[33] Emphasis added.
[34] Emphasis added.
[35] Column 16, lines 12-13.

Claims 12, 20 and 32 recite "applying a time stamp to each of the *plurality of addressing functions*."[36] The rejection of these claims cites the notification sequence number mentioned in column 12, line 3 of Boyle. First, the notification sequence number is merely a number used to queue notifications for delivery to client device 106, and is not a time stamp. Second, the notification sequence number relates to the PUSH PDU sent to client device 106 to notify the device of new content, and is not applied to URLs, which are apparently the element of Boyle being relied upon as disclosing the claimed "addressing functions".

C. Boyle Does Not Disclose All of the Elements of Claims 13, 14 and 33

Claims 13, 14 and 33 recite that "the addressing functions are hash functions." The rejection cites column 16, lines 55-65 of Boyle, which discusses an authentication procedure of step 777 to provide undelivered notifications of new content to client device 106. Although this section does mention that URLs received in the notifications are used to "fetch the updates identified by the URL from the web server device on the Internet"[37], there is nothing in this or any other section of Boyle disclosing that the URLs "are hash functions."

D. Boyle Does not Disclose All of the Elements of Claim 34

Boyle does not anticipate claim 34 because Boyle does not disclose at least the calculation and forwarding recited in this claim. Appellants' claim 34 recites

[36] Emphasis added.
[37] Column 16, lines 63-65.

a first node that calculates a second and third node that store messages using *a subscriber identifier and respective first and second addressing functions*.

It appears that the Office Action interprets link server device 114 of Boyle as corresponding to the claimed "first node", the URLs of Boyle as corresponding to the claimed "addressing function", and web servers 202 of Boyle as corresponding to the claimed second and third node. As discussed above, the URLs of Boyle are merely addresses, and not "addressing *functions*."

Furthermore, Boyle discloses that link server device 114 *only uses* a URL to identify from which web server to obtain information. Boyle does not disclose that *both* the subscriber ID *and* the URL are employed to identify the web server from which to obtain information. Instead, the same web server that corresponds to the URL is selected regardless of the particular subscriber ID. Accordingly, Boyle does not expressly or inherently disclose a first node using a subscriber ID and first and second addressing functions to respectively calculate second and third nodes that store messages, and the rejection of claim 34 by Boyle should be withdrawn.

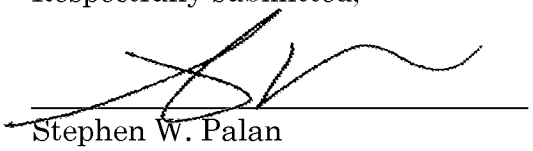
VIII. CONCLUSION

For at least those reasons set forth above, the rejection of claims 1-36 for anticipation by Boyle is improper and should be reversed.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 05-1323, Docket No.: 101610.55984US.

Respectfully submitted,

December 2, 2008



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CLAIMS APPENDIX

1. A method of managing a network, comprising:

calculating a plurality of destination nodes based on a subscriber identifier and a plurality of addressing functions, each addressing function corresponding to a topology of the network at a particular moment in time;

querying the calculated plurality of destination nodes for a message.

2. The method of claim 1, further including:

receiving a message retrieval request at an initial retrieval node of the network, the message retrieval request including the subscriber identifier.

3. The method of claim 2, further including:

receiving the message from one of the calculated plurality of destination nodes; and

forwarding the message toward an originator of the message retrieval request.

4. The method of claim 3, wherein the originator of the message retrieval request is a wireless handset, the message being at least one of a short messaging service message and a mail digest.

5. The method of claim 3, wherein the originator of the message retrieval request is a wireless handset, the message being a long messaging service message.

6. The method of claim 3, further including:

receiving a plurality of messages from the calculated plurality of destination nodes; and

forwarding the plurality of messages toward the originator of the message retrieval request.

7. The method of claim 2, further including:

receiving the message at an initial storage node, the message including the subscriber identifier;

calculating an actual destination node based on the subscriber identifier and a current addressing function corresponding to a current topology of the network; and

sending the message to the actual destination node for storage, the calculated plurality of destination nodes including the actual destination node and the plurality of addressing functions including the current addressing function.

8. The method of claim 7, further including:

storing the message to an internal queue of the initial storage node; and

removing the message from the internal queue if a confirmation of receipt is received from the actual destination node.

9. The method of claim 7, further including sending a message waiting indicator message toward a device associated with the subscriber identifier.

10. The method of claim 1, further including expiring one or more of the plurality of addressing functions based on a message validity period.

11. The method of claim 1, further including expiring one or more of the plurality of addressing functions for an expired destination node based on a local expiration signal from the expired destination node.

12. The method of claim 1, further including:

applying a time stamp to each of the plurality of addressing functions; and

delivering each of the plurality of addressing functions to the plurality of destination nodes before activation.

13. The method of claim 1, wherein the addressing functions are hash functions.

14. A method of managing a network, comprising:

receiving a message at an initial storage node, the message including a subscriber identifier;

calculating an actual destination node based on the subscriber identifier and a first addressing function corresponding to a current topology of the network;

sending the message to the actual destination node for storage;

storing the message to an internal queue of the initial storage node;

removing the message from the internal queue if a confirmation of receipt is received from the actual destination node;

sending a message waiting indicator message toward a device associated with the subscriber identifier;

receiving a message retrieval request at an initial retrieval node of the network, the message retrieval request including the subscriber identifier;

calculating a plurality of destination nodes based on the subscriber identifier and a plurality of addressing functions, each addressing function corresponding to a topology of the network at a particular moment in time, the plurality of destination nodes including the actual destination node and the plurality of addressing functions including the first addressing function;

querying the calculated plurality of destination nodes for the message;

receiving the message from the actual destination node; and

forwarding the message toward an originator of the message retrieval request, wherein the addressing functions are hash functions.

15. The method of claim 14, wherein the originator of the message retrieval request is a wireless handset, the message being at least one of a short messaging service message and a mail digest.

16. The method of claim 14, wherein the originator of the message retrieval request is a wireless handset, the message being a long messaging service message.

17. The method of claim 14, further including:

receiving a plurality of messages from the calculated plurality of destination nodes; and

forwarding the plurality of messages toward the originator of the message retrieval request.

18. The method of claim 14, further including expiring one or more of the plurality of addressing functions based on a message validity period.

19. The method of claim 14, further including expiring one or more of the plurality of addressing functions for an expired destination node based on a local expiration signal from the expired destination node.

20. The method of claim 14, further including:

applying a time stamp to each of the plurality of addressing functions; and

delivering each of the plurality of addressing functions to the plurality of destination nodes before activation.

21. A computer readable medium to store a set of instructions capable of being executed by a processor to:

calculate a plurality of destination nodes based on a subscriber identifier and a plurality of addressing functions, each addressing function to correspond to a topology of a network at a particular moment in time;

querying the calculated plurality of destination nodes for a message.

22. The medium of claim 21, wherein the instructions are further capable of being executed to:

receive a message retrieval request at an initial retrieval node of the network, the message retrieval request including the subscriber identifier.

23. The medium of claim 22, wherein the instructions are further capable of being executed to:

receive the message from one of the calculated plurality of destination nodes; and

forward the message toward an originator of the message retrieval request.

24. The medium of claim 23, wherein the originator of the message retrieval request is to be a wireless handset, the message to be at least one of a short messaging service message and a mail digest.

25. The medium of claim 23, wherein the originator of the message retrieval request is to be a wireless handset, the message to be a long messaging service message.

26. The medium of claim 23, wherein the instructions are further capable of being executed to:

receive a plurality of messages from the calculated plurality of destination nodes; and

forward the plurality of messages toward the originator of the message retrieval request.

27. The medium of claim 22, wherein the instructions are further capable of being executed to:

receive the message at an initial storage node, the message to include the subscriber identifier;

calculate an actual destination node based on the subscriber identifier and a current addressing function corresponding to a current topology of the network; and

send the message to the actual destination node for storage, the calculated plurality of destination nodes to include the actual destination node and the plurality of addressing functions to include the current addressing function.

28. The medium of claim 27, wherein the instructions are further capable of being executed to send a message waiting indicator toward a device associated with the subscriber identifier.

29. The method of claim 27, wherein the instructions are further capable of being executed to:

store the message to an internal queue of the initial storage node; and

remove the message from the internal queue if a confirmation of receipt is received from the actual destination node.

30. The medium of claim 21, wherein the instructions are further capable of being executed to expire one or more of the plurality of addressing functions based on a message validity period.

31. The medium of claim 21, wherein the instructions are further capable of being executed to expire one or more of the plurality of addressing functions for an expired destination node based on a local expiration signal from the expired destination node.

32. The medium of claim 21, wherein the instructions are further capable of being executed to:

apply a time stamp to each of the plurality of addressing functions; and

deliver each of the plurality of addressing functions to the plurality of destination nodes before activation.

33. The medium of claim 21, wherein the addressing functions are to be hashing functions.

34. A method of managing a network, comprising:

receiving, by a first node that stores messages, a message retrieval request;

calculating, by the first node using a subscriber identifier and a first addressing function, a second node that stores messages;

calculating, by the first node using the subscriber identifier and a second addressing function, a third node that stores messages; and

forwarding, by the first node, the message retrieval request to the second and third nodes.

35. The method of claim 34, wherein the first and second addressing functions correspond to a topology of the network at different moments in time.

36. The method of claim 34, wherein the first and second addressing functions are hash functions, and the first and second addressing functions each have a different expiration time.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None